

REMARKS

The Office Action dated October 6, 2010 has been carefully reviewed, and the foregoing amendment has been made in consequence thereof.

Claims 1-3, 5, 6, 15-17, 19, 20, 29-31, 33, and 34 are pending in this application. Claims 1-3, 5, 6, 15-17, 19, 20, 29-31, 33, and 34 stand rejected.

Initially, Applicants note that the Office Action Summary indicates that Claim 30 is not currently pending. Applicants respectfully submit that Claim 30 is still currently pending, and Applicants respectfully request notification to that effect.

The rejection of Claims 1-3, 5, 6, 15-17, 19, 20, 29, 31, 33, and 34 under 35 U.S.C. § 112, first and second paragraphs, is respectfully traversed. Applicants have amended Claims 1, 15, and 29 in accordance with the suggestions in the Office Action. Accordingly, Applicants submit that Claims 1, 15, and 29 are in compliance with Section 112, first and second paragraphs. Each of Claims 2, 3, 5, 6, 16, 17, 19, 20, 31, 33, and 34 depends from one of Claims 1, 15, and 29. When the recitations of each of Claims 2, 3, 5, 6, 16, 17, 19, 20, 31, 33, and 34 are considered in combination with the recitations of the respective one of Claims 1, 15, and 29, Claims 2, 3, 5, 6, 16, 17, 19, 20, 31, 33, and 34 are likewise submitted as being in compliance with Section 112, first and second paragraphs. For at least the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-3, 5, 6, 15-17, 19, 20, 29, 31, 33, and 34 be withdrawn.

The rejection of Claims 1, 5, 6, 15, 19, 20, 29, 33, and 34 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,449,330 to Li et al. (hereinafter referred to as “Li”) in view of U.S. Patent No. 6,529,575 to Hsieh (hereinafter referred to as “Hsieh”) and “Generalized multi-dimensional adaptive filtering for conventional and spiral single-slice, multi-slice, and cone-beam CT” by Kachelries et al. (hereinafter referred to as “Kachelries”) is respectfully traversed.

Li describes a computed tomography (CT) imaging system (10) that includes an x-ray source (14), a detector array (18), and a data acquisition system (DAS) (32) that

samples analog data from detector array (18) and converts the data to digital signals for subsequent processing. During a scan to acquire x-ray projection data, x-ray source (14) rotates about a center of rotation (24) to generate projection data. Notably, Li does not describe or suggest utilizing smoothing kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed.

Hsieh describes a system for reducing noise in an x-ray image. The system includes a gantry having an x-ray source and a radiation detector array. The gantry defines an object cavity, and the x-ray source and the radiation detector array are rotatably associated with the gantry so as to be separated by the object cavity. The system also includes an object support structure movingly associated with the gantry so as to allow communication with the object cavity and a processing device having an adaptive projection filtering scheme. The filtering scheme generates system information, obtains original projection data, determines a data characteristic of the original projection data, processes the original projection data responsive to the system information and the data characteristic so as to create filtered projection data, and calculates resulting projection data responsive to the filtered projection data. Notably, Hsieh does not describe or suggest utilizing smoothing kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed.

Kachelries describes filter widths that are set as a function of a given, view dependent threshold T, and the threshold function is determined as a function of the underlying object or anatomy. (See Section III, Page 477). Notably, Kachelries does not describe or suggest utilizing smoothing kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold of the set of thresholds is triggered smoothing

in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed.

Claim 1 recites a method for reconstructing an image of an object in a computed tomographic imaging system. The method includes “scanning an object using a computed tomographic (CT) imaging apparatus to acquire projections of the object; determining, utilizing the projections, a set of scaled prepped projection thresholds; associating selected smoothing kernels with the thresholds; utilizing, via the computed tomographic imaging system, the smoothing kernels and the projections to produce projections smoothed in three dimensions in accordance with the thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed; and filtering and backprojecting the projections to generate an image of the object in the computed tomographic imaging system.”

No combination of Li, Hsieh, and Kachelries describes or suggests a method for reconstructing an image of an object in a computed tomographic imaging system as is recited in Claim 1. Specifically, no combination of Li, Hsieh, and Kachelries describes or suggests utilizing smoothing kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed. Rather, Li merely describes an x-ray source that rotates about a center of rotation to generate projection data, Hsieh merely describes a filtering scheme that generates system information, obtains original projection data, determines a data characteristic of the original projection data, processes the original projection data responsive to the system information and the data characteristic so as to create filtered projection data, and calculates resulting projection data responsive to the filtered projection data, and Kachelries merely describes a given, view dependent threshold T and a threshold function that is determined as a function of the underlying object or anatomy. Accordingly, Claim 1 is submitted as being patentable over Li, Hsieh, and Kachelries.

Claims 5 and 6 depend from independent Claim 1. When the recitations of Claims 5 and 6 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 5 and 6 likewise are patentable over Li, Hsieh, and Kachelries.

Claim 15 recites a CT imaging apparatus including “a detector; a source configured to project a beam of x-rays toward said detector; and a computer system operatively coupled to at least one of said detector and said source, said computer system comprising: a first module configured to scan an object to acquire projections of the object; a second module configured to determine, utilizing the projections, a set of scaled prepped projection thresholds; a third module configured to associate selected smoothing kernels with the thresholds; a fourth module configured to utilize the smoothing kernels and the projections to produce projections smoothed in three dimensions in accordance with the thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed; and a fifth module configured to filter and backproject the projections to generate an image of the object.”

No combination of Li, Hsieh, and Kachelries describes or suggests a CT imaging apparatus as is recited in Claim 15. Specifically, no combination of Li, Hsieh, and Kachelries describes or suggests utilizing smoothing kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed. Rather, Li merely describes an x-ray source that rotates about a center of rotation to generate projection data, Hsieh merely describes a filtering scheme that generates system information, obtains original projection data, determines a data characteristic of the original projection data, processes the original projection data responsive to the system information and the data characteristic so as to create filtered projection data, and calculates resulting projection data responsive to the filtered projection data, and Kachelries merely describes a given, view dependent threshold T and a threshold function that is determined as a function of the underlying

object or anatomy. Accordingly, Claim 15 is submitted as being patentable over Li, Hsieh, and Kachelries.

Claims 19 and 20 depend from independent Claim 15. When the recitations of Claims 19 and 20 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claims 19 and 20 likewise are patentable over Li, Hsieh, and Kachelries.

Claim 29 recites a computer storage medium comprising instructions thereon. The instructions are configured to instruct a computer to: "determine, utilizing projections obtained by scanning an object, a set of scaled prepped projection thresholds; associate selected smoothing kernels with the thresholds; utilize the smoothing kernels and the projections to produce projections smoothed in three dimensions in accordance with the thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed; and filter and backproject the projections to generate an image of the object."

No combination of Li, Hsieh, and Kachelries describes or suggests a computer storage medium as is recited in Claim 29. Specifically, no combination of Li, Hsieh, and Kachelries describes or suggests utilizing smoothing kernels and projections to produce projections smoothed in three dimensions in accordance with a set of scaled prepped projection thresholds such that when a first threshold of the set of thresholds is triggered smoothing in three dimensions is performed and when the first threshold is not triggered smoothing in three dimensions is not performed. Rather, Li merely describes an x-ray source that rotates about a center of rotation to generate projection data, Hsieh merely describes a filtering scheme that generates system information, obtains original projection data, determines a data characteristic of the original projection data, processes the original projection data responsive to the system information and the data characteristic so as to create filtered projection data, and calculates resulting projection data responsive to the filtered projection data, and Kachelries merely describes a given, view dependent threshold T and a threshold function that is determined as a function of the underlying

object or anatomy. Accordingly, Claim 29 is submitted as being patentable over Li, Hsieh, and Kachelries.

Claims 33 and 34 depend from independent Claim 29. When the recitations of Claims 33 and 34 are considered in combination with the recitations of Claim 29, Applicants submit that dependent Claims 33 and 34 likewise are patentable over Li, Hsieh, and Kachelries.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 5, 6, 15, 19, 20, 29, 33, and 34 be withdrawn.

The rejection of Claims 2, 3, 16, 17, 30, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Li in view of Hsieh and Kachelries is respectfully traversed.

Li, Hsieh, and Kachelries are described above.

Claims 2 and 3 depend from Claim 1. As stated above, Claim 1 is submitted as being patentable over Li, Hsieh, and Kachelries. When the recitations of Claims 2 and 3 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2 and 3 likewise are patentable over Li, Hsieh, and Kachelries.

Claims 16 and 17 depend from Claim 15. As stated above, Claim 15 is submitted as being patentable over Li, Hsieh, and Kachelries. When the recitations of Claims 16 and 17 are considered in combination with the recitations of Claim 15, Applicants submit that dependent Claims 16 and 17 likewise are patentable over Li, Hsieh, and Kachelries.

Claims 30 and 31 depend from Claim 29. As stated above, Claim 29 is submitted as being patentable over Li, Hsieh, and Kachelries. When the recitations of Claims 30 and 31 are considered in combination with the recitations of Claim 29, Applicants submit that dependent Claims 30 and 31 likewise are patentable over Li, Hsieh, and Kachelries.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 2, 3, 16, 17, 30, and 31 be withdrawn.

In view of the foregoing amendment and remarks, all of the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Respectfully Submitted,



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